
HORSE BREEDING MANUAL

BY

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HORSE BREEDING MANUAL.

ind^y a
breth^h be desirous of becoming a successful breeder of horses
pro^d have a liking for them, and should possess himself of
ho^h cient knowledge to enable him to exercise that care
wh^{ch} the brood mare and her produce require at his hands.
An ignorant breeder may have the finest mare and foal
in the world, and, owing to his want of knowledge as to
their management, may so spoil them as to render them
absolutely useless; whereas another, who has mastered
the elements of the subject, may, by exercising proper
care in their management, make a great improvement
in what seems at first sight to be inferior material. There
is an old adage in this country to the effect that a good
sword cannot be made from bad iron, but, at the same time,
it is evident that an experienced armourer will produce a
better weapon from inferior material than one who has no
knowledge of the subject will make from the finest steel.
It is, therefore, obviously to the advantage of the breeder to
make himself as well acquainted with his subject as possible,
and to avail himself of the experience of those who have
been actively engaged in the pursuit, and have made it a
special study. It is for the purpose of placing at the disposal
of the breeder the available information in as small a space
as is possible for handy reference, that this small manual has
been prepared.

It has been remarked by the writer of an article on the
subject of horse breeding in India that in order to make it
pay we must breed race horses. This applies of course to
those who take up the enterprise as a commercial specu-
lation, but to the case of those who have mares which they
can use for work it does not apply. The zamindar who
keeps a few mares to ride can profitably engage in horse
breeding. Whoever the breeder may be, however, he must
look to the production of horses of superior breed, and the
improvement of that breed, as matters of profitable specu-
ation, and in order to reap the fullest advantage he *must*,
or his own sake, procure the best mare he can possibly get
and also select the most suitable stallion available to mate
with her.

For the provision of the mare he may, according to circumstances, have recourse to two methods of proceeding: he may buy a mare possessing all the qualities of a good brood animal, or, if he already possesses a mare of indifferent quality, he may take the earliest opportunity of replacing her with one leaving little to be desired, preferably a filly of his own breeding, produced by crossing his mare with one of the imported stallions.

In adopting the first plan, which is the quicker, the breeder should not grudge the price given for a really good mare, for the produce of such a mare by a well selected horse, will of course sell for a better price and prove more remunerative than will that from a mare of inferior quality. In the same way, when a filly suitable for brood purposes has been produced from the original indifferent mare, the breeder must not hesitate to keep her, for, by temporarily sacrificing the sum which he would obtain from her sale, he, as it were, invests it at a higher rate of interest, for the produce will sell so much better that he will soon recover his capital and still have the mare in hand.

In any case it is to the breeder's advantage to keep the best mare possible, for it must be borne in mind that it costs no more to maintain a good mare than it does a bad one, and the operations must be more profitable with the former. It may seem unnecessary to dwell on this subject, as the facts mentioned are such as would commend themselves to anyone of ordinary intelligence, yet, strange to say, the ordinary breeder in this country, either from ignorance or avarice, very often takes the opportunity of selling a good filly which he has bred and keeping on the old brood mare with which he started, the improvement of horses being thus somewhat retarded.

There are a few points in connection with horse breeding which it seems to me to be advisable to notice in this manual, and these are connected with certain circumstances which, directly or indirectly, have a marked influence on the horse: such are climate, food, stabling, work, etc.

The influence of any particular district or country on horse stock may be readily gathered from the class of horse which is to be found in it, for, by their size and conformation, they evidence the effect of the influences to which they have been exposed. With regard to the influence of climate in India, we know that in certain parts of the country,

horses can scarcely be bred at all. In Lower Bengal, for example, with its damp, hot climate, it is next to impossible to breed strong, useful horses. The same is true of many parts of the Madras Presidency, and other parts of Southern India, where the climate is absolutely against the industry. The parts of the country best suited for horse breeding are those having a dry, mild, or even hot climate, provided it is not moist. There are certainly no better horses produced in the country than are to be found in the Northern Districts, especially the North Punjab, Derajat and Baluchistan, and these are the parts which must be looked to for the improvement of the breed and the production of horses of high quality.

The people of these parts keep mares which they ride, and feed them fairly well, whilst the young stock here have more chance of getting freedom and exercise than have those of other parts as they follow the mare when she is being ridden.

There are some points which seem worthy of notice here in connection with breeding and the brood stock. As has already been stated, those mares the result of crossing the indigenous stock with the imported stallions are the best for breeding, as they are more certain as to the quality of the stock they throw. It is of great importance that they should be in good health and free from hereditary disease or unsoundness. They should have good eyesight, broad, deep chests, be well put together and well ribbed up, have good, flat, straight legs, well under them, and have large joints with good bone; they should stand over a lot of ground and have well developed muscles and good, hard, sound feet.

It must never be forgotten that, not only are superior forms and attributes transmitted from parents to offspring, but that the defects, malformations and some forms of unsoundness, and the predisposition thereto, seem to enjoy a special privilege of reappearing in succeeding generations. The stock generally inherit a modification of the forms and qualities of the parents, and an improvement once made in a horse may be passed on to his offspring by careful selection of the future partners, so that it may become fixed, and a typical character of an improved race.

It is evident, therefore, that it would be a mistake to breed from stock which are affected with unsoundness likely to be passed on from parent to offspring, or which have defective conformation. The more important diseases which are capable of being passed on are,—Periodic Ophthalmia, Curb,

Spavin, Ringbone, Navicular disease, Cataract, Iritis, Whistling, Roaring, Sidebone, Laminitis and defective feet.

Some certain defects of conformation, such as narrow chest, saddle back, mean small hocks and joints, should be guarded against.

We must also take into consideration bad temper, which is undeniably inherited.

It is by no means an easy matter to assign the exact influence which the sire and dam respectively exercise on the produce. In principle the influence of the purer bred animal will be the greater, and it thus follows that the thoroughbred stallion will stamp the stock more than the mare will if she be of inferior breeding. It is a universally admitted fact that the nearer an animal approaches the primitive type of his race, that is to say, the purer bred he is, the greater influence will he have in reproduction, and thus it is that the pure bred Arab and the thoroughbred stamp their stock.

In mating two individuals, one strong and robust, the other weak and fatigued, the produce will more closely resemble the former. If one of the parents is bad tempered, we generally find that this is reproduced in the stock.

When one of the parents is in the prime of life, and the other is very young or very old, the produce generally takes after the former as regards its conformation and often as regards its sex also. As regards conformation, it appears that the stallion transmits that of the forehead and extremities, strength, energy and capacity for work, and that the mare gives height, volume of the trunk, and the conformation of the hind quarters, but in all cases it happens that the more highly bred of the two has the greater influence on the foal.

Taking into consideration the importance of the stallion in the reproductive act, it is of greater importance that the horse should be more representative than the mare.

SELECTION OF THE MARE.

The selection of the mare for breeding purposes in this country, so far as the Government horse breeding is concerned, is left to the Superintendent of the Civil Veterinary Department of the circle. The mare is inspected by him, and, if approved, is branded, either on the shoulder or the back, with the mark of the Department. In order that a mare may be branded she must be sound, of suitable

build and conformation, and between the ages of 3 and 16 years. The brand entitles the mare to service by any Government stallion free of charge. The Superintendent, at the time of branding, allots the mare to the class of horse which he considers the most suitable for her. This greatly simplifies matters so far as the breeder is concerned. I am afraid that the allotment of the mare by the Superintendent is not in all cases adhered to, and this is, as a rule, to be regretted, as in most cases he is a better judge of what class of stallion is most suitable for the mare, than the owner is.

Those who are commencing breeding and have the opportunity of selecting mares for the purpose, cannot, as has been said before, do better than get the best mare available.

It is quite a mistaken policy to commence breeding from ill-shaped, inferior, bad-acted animals, or old, worn out creatures of 15 or 16 years of age, and such a proceeding can only lead to disappointment and loss. None but good, sound, young mares should be selected, and from such we may expect to obtain some ten or a dozen foals which will fetch a good high price and render the operations remunerative. The mares obtainable are, for the most part, mongrel ones, and it is best to select good specimens of those which are the produce of Government stallions, of good shape and with plenty of bone and substance.

When buying mares which have already had foals, we can form some opinion of the chances of success which we are likely to meet with from an inspection of the foal, and this will be a useful guide. The first requisite in a brood mare is, that she should be long, deep and roomy, so that there may be plenty of room for the foal to develop; leggy and short mares cannot be expected to throw big foals, and many imperfections may be overlooked rather than these two. An examination of the udder should be made as regards its development, and whether it is equal on both sides. The state of the last foal, if there has been one, as regards condition, must be taken into account.

Very large mares (and horses as well) are likely to cause disappointment. On some occasions they produce foals as large as themselves, whilst at other times their stock will be small and puny. A moderate sized, or indeed a well-shaped, small mare, if mated with a horse of suitable size is more likely to produce useful and more valuable foals than is a large mare. This is generally admitted by all who have

had any experience of breeding, and it is the more applicable to this country for the reason that the breed here is naturally a small one. We should avoid great disparity between the size of sire and dam.

In purchasing mares for breeding purposes it must be borne in mind, as has already been pointed out, that it costs no more to keep a good horse than it does a bad one, and that we are more likely to recover the original cost of a good mare by the sale of her produce than we are that of a poor one.

The mares to be found in the districts which I have indicated as the best for breeding purposes, *viz.*, Baluchistan and the Punjab, may be briefly described as follows:—*The Baluch mare* has rather long ears with a twist at the point; a lean head with a trifling forward curve from the forehead to the upper part of the nasal bones; a good shoulder, moderately deep and broad chest; she has angular drooping quarters, and is very broad across the hips. The best mares are about 14-1 in height, seldom above 14-3 or under 14 hands. They are remarkably sound, have good, hard, sound hoofs and better legs than the average of Indian horses. Their most frequent defect is want of barrel. They are supposed to be of Arab descent and are fed very much in the same way as Arabs are.

They can carry about 11 stone at an average pace of six miles an hour for forty miles, although they can do eighty miles in the day in the same way without much distress. These mares mated with very high caste large framed Arabs, or with good boned thoroughbreds of about 15-2 will produce excellent light cavalry remounts.

The Punjabi mares.—These are mostly of one type, having long, narrow, plain heads and convex noses; deep, fairly oblique shoulders; they have good barrels and loins and deep chests; the quarters are broad but very drooping, and not so muscular as they should be in comparison to the rest of the body; although too small under the knee according to our English notions they seldom fail there; their feet are good and sound, generally, however, deformed from neglect. They are often sickle hocked, and have the toes of the fore feet turned out very much. The unsoundnesses are spavined hocks and sprained hind fetlocks.

The horses of the desert, tracts of the south are better shaped and sounder than those of the north, for the inhabitants of the former districts used to be marauders, and had

to give their horses thorough exercise in order to keep them in condition for the long distances they had to travel; nearly all the landowners ride mares, for they are both profitable and useful.

On a journey they go at the rate of from four to six miles an hour, and the foal follows the dam. The mares range from 14 to 15.2 hands in height, occasionally reaching 16 hands, but the best of them are from 14.1 to 15 hands high.

These mares will, undoubtedly, if mated with suitable stallions, produce horses fit for the British cavalry, provided the stock is properly and liberally fed when young, and reared on the liberty system.

Such are the mares we have to work with, and it only remains to select from them the best available to begin with and to get the best stallion in the district to cover her.

CARE OF STALLIONS.

Stables.—The stables intended for the reception of Government or other stallions should leave nothing to be desired so far as their situation, sanitation, etc., are concerned. The site chosen should be open, more or less isolated, and possess a dry soil and good natural drainage.

It is advisable to have the stables in a place where there is but little traffic, as nervous, excitable horses will get no rest, but will wear themselves out if they can see, hear or smell other horses and more especially mares passing near them.

With regard to the construction of the stables, there is a standard plan maintained in the office of the Inspector General of the Civil Veterinary Department at Simla, which has been prepared as a guide for the building of these stables.

The boxes should be large and airy, the larger the better, so that the horse can move about in them freely and thus get a certain amount of exercise. The floors must be well raised above the level of the surrounding ground, so that the stables may remain dry at all times. Care must be taken to have plenty of ventilation, as this is necessary to maintain the horse in good health. These are really the chief points to be observed, and the plan alluded to will give details of all other points connected with the subject.

Ventilation.—The stable windows and ventilators in the walls should always be kept open.

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Ventilation.—The stable windows and ventilators in the walls should always be kept open.

The chinks of the doorways should be let down between the hours of 10 A.M. and 4 P.M. during the hot months when the flies are troublesome, and also at night in the winter, when the air is cold.

Cleanliness.—The flooring of the stalls must always be kept clean and level. Dung and urine are to be removed immediately they are passed and dry earth should be spread over the place where urine has fallen. The evacuations, soiled portions of the bedding and foul earth of the floors should be deposited at a distance, so as to prevent the offensive smell from them reaching the stable, and also to avoid attracting flies which naturally congregate on them. If these precautions are not observed the stallions are liable to fall sick, and their feet are certain to become diseased if they are allowed to stand in the evacuations; there is no more fruitful source of diseased frogs than is decomposing urine, the ammonia from which has a very injurious effect on the horn.

Bedding.—A sufficiency of clean, dry, soft bedding must be provided in order that the stallion may be able to lie down comfortably: this is of more importance than is generally supposed, and in Yorkshire we reckon that a good comfortable bed for a horse is as good as a feed of corn. It is a common practice in this country to use hay of inferior quality as bedding; this practice is one which I cannot advocate, as a good sweet bed cannot be made from bad hay; but there is a still more serious objection to its use, and that is that the horse may eat it, for we are aware of the fact that many horses do eat their bedding, and should they eat this bad hay there is every chance that some intestinal disease will soon result and the horse's life probably be lost. Care must at all times be exercised to prevent the stallion from eating his bedding as it cannot but be injurious to him, and if a plentiful supply of fodder has not the desired effect, a muzzle must be put on when he is bedded down.

The bedding should be removed from the stable and exposed to the sun every morning so that it may be dried; those portions of it which are dirty should be removed, and the rest used again. When it gets old it should be thrown away and a fresh supply put down.

Yard.—To prevent other horses from coming into the stallion compound, it should be surrounded by walls at least five feet high which should be provided with a strong gate to lock.

A stallion should not be tied up in the stable excepting when it is necessary for grooming: he should be kept loose in his box which is provided with strong wooden bars instead of doors.

Watering.—The water supplied to stallions must be of the best quality obtainable. They should be watered at least three times a day if water is not always kept before them, which latter is by far the better practice. When horses are watered at stated intervals during the day, great care must be taken to see that they are not fed until at least half an hour has elapsed since they were watered, as, if this is neglected, there is considerable danger of the horse being attacked with colic, indigestion or other intestinal affections. It is also necessary to avoid watering for some considerable time after feeding, which is really more fatal than watering immediately before, as the whole of the fluids which take part in the digestion of the food are at this time in just the right proportions and of the right strength to accomplish this function, and, if water be given whilst this is going on, the fluids, being diluted, at once cease to perform their work and indigestion is the result. When horses are watered soon after feeding, as the water, in part at all events, passes through the stomach quickly, there is every chance of some of the food which has been partially digested, but not properly so, being carried with it into the gut, setting up irritation there, and giving rise to colic, indigestion and the like diseases.

Feeding.—Stallions require a liberal supply of the best procurable food. The diet laid down for Government stallions in this country is as follows:—

From 15th September to the 31st May—

Gram (crushed)	.	.	.	.	.	4 lbs.
Barley (crushed)	.	.	.	.	.	4 lbs.
Bran	.	.	.	.	.	2 lbs.
Salt	.	.	.	.	.	1 oz.
Green dub grass	.	.	.	.	.	40 lbs.
Lucerne	} if available					10 lbs.
Carrots						4 lbs.

From the 1st June to the 14th September—

Gram (crushed)	.	.	.	.	.	3 lbs.
Barley (crushed)	.	.	.	.	.	3 lbs.
Bran	.	.	.	.	.	2 lbs.
Salt	.	.	.	.	.	1 oz.
Green grass	.	.	.	.	.	40 lbs.
Lucerne, if available	.	.	.	.	.	10 lbs.

seen that where the roads are gritty and are likely to wear out the horn of the hoof quickly it is necessary to have the horses shod. When shod the shoes must be regularly removed the feet properly reduced, and new shoes applied once a month if the old ones are worn out; if not the old ones may be fitted and reapplied.

Serving of mares.—The number of mares which a stallion may cover during the season varies somewhat according to circumstances, and especially with the age of the horse. To begin with, a young horse should cover about 40 mares during his first season. When he gets a little older and more robust in condition, he may cover from 60 to 70 in the year. The amount of covering which a stallion does seems to have some influence on his procreative powers, as will be seen from the following figures given by Gayot in the *Diet-de. Med. Vet.*, vol. 1, page 419. The figures relate to the royal stud horses in France:—

Year.	No. of mares.	% of foals.
1830-40	32	28½
1840-45	42	39
		47½ in 1848
1846-51	49	48¾ in 1849
		49¾ in 1850
		50½ in 1851

From this it appears that the percentage of foalings is increased by moderate use, and the same fact has been noted in the Punjab. In this country, especially with imported horses, it is necessary to exercise judgment in this matter, for the stallions are kept under adverse conditions as regards supervision, and, if the number of mares allowed to each horse be great, there is some danger of his powers being overtaxed, either owing to mismanagement of the coverings or to illicit ones carried out in addition to the number allowed. The number of mares allotted to each Government stallion is 60, and this number should on no account be exceeded, unless by the direction of the Superintendent in charge, who will be able to judge whether the horse is capable of covering more without detriment to himself.

A stallion should not be allowed to cover more than twice in one day, either one mare twice, or two mares once each. The time for covering is either before 8 A.M. or after 4 P.M.

A stallion should not be allowed to cover more than five times in a week. Old and very young stallions should only cover once a day. Covering should take place before feed-

ing, or at least two hours afterwards. It is dangerous to allow horses to cover a short time after feeding or drinking. Food which has not been eaten should therefore be removed from the manger at least an hour before the horse is allowed to cover.

When a mare is to be covered the following procedure is to be observed :—

The person in charge of the stallion must satisfy himself that the mare is free from any kind of contagious disease, such as glanders, farcy, mange, etc., etc. Mares having enlarged glands under the jaw, the slightest erosion of the nostril, a discharge of any kind from the nose, purulent swellings on the body or ulcers on the vagina should be refused.

The place selected for covering should be quiet and retired, so that nothing can interfere with the operation. The ground should be level and not slippery. In most of the Government stallion stables there is a covering yard specially set apart for the purpose, and, wherever a stallion is kept in this country, it is advisable to have one made. It sometimes happens that a stallion has to cover a mare taller than himself, and, in order to facilitate this, it is well to have a part of the covering yard set apart, in which there is a depression into which the mare may be placed, so as to bring her into a lower level than the horse.

No mare may be covered before she has been hobbled in the usual way, that is, on both hind and one fore foot, as, however quiet she may appear to be, there is always a danger of her kicking the horse after she has been served, and in this way a serious accident may happen. If the mare's tail is long it is a good plan to knot it and to attach a cord to it, so that an assistant may pull it to one side easily, and thus keep it out of the way. A proper bridle is provided at each stallion stand, to be used on the mare, as the bridles used by breeders are generally rotten and easily break if the mare knocks about, so that she gets loose : very serious accidents may in this way result and care must be taken to prevent their occurrence. If the mare be very restive, it is customary in many places to apply a twitch to her nose, but this is a practice which I deprecate, and, unless all other means of quietening her fail, I would avoid the use of the instrument. In any case, if it be applied, it should be removed as soon as the horse is in position. The mare being prepared, the stallion is led out of the stable, either with a cavesson or a bridle, or roped in the usual way, and is con-

ducted to the mare and allowed to smell her and prepare himself. During this part of the covering care must be taken to check the horse if he be too eager, otherwise he will mount before he is prepared, and the covering will be prolonged: it must be borne in mind that the horse is not to be checked too roughly, as, if he is, there is some danger of his coming over and injuring himself. When the horse has prepared himself properly he should be allowed to mount, the penis being seized near the bulb and directed into the vagina. This shortens the time taken over covering and prevents the horse making a false passage into the rectum, which often happens otherwise, and which is attended with some danger of rupture of that organ. When the horse is a small one and weak in his hocks much assistance can be given him by supporting his shoulders and buttocks.

When the operation is over, as will be ascertained by general relaxation of the muscles of the body and a spasmodic trembling of the tail, the mare is to be led on so that the horse has not to be backed on his hocks before descending. The horse should now be led off to his stable and attended to, the penis should be washed, the horse rubbed over and clothed up.

The mare is led away and walked about slowly for an hour and then put into a quiet stable for a day or two. It is customary in some parts to throw a pailful of water over the mare's hind quarters as soon as the stallion has left her, and this is done with the idea that it helps to secure conception.

The whole of the operations of covering should be performed quietly, without any shouting or noise.

In the case of branded mares, whenever possible, they should be covered by the class of stallion to which they have been allotted by the Superintendent in charge; and a mare once covered by a hackney should not be subsequently covered by a thoroughbred and *vice versa*. It is a generally admitted fact that the horse which first covers the mare has a considerable influence on the foals which are produced as the result of subsequent coverings, and it is manifestly of importance therefore to get the best possible horse to begin with. If a mare throws a good foal to a certain stallion she should, if possible, be put to the same horse again, as a good result is more likely to follow than if she be put to another horse.

Branded mares and fillies.—With regard to Government horse breeding, only mares which have been inspected and

approved by the Superintendent of the Civil Veterinary Department, who is in charge of the operations, may be covered by Government stallions free of charge.

Any filly which comes up to the requirements of the Department can be branded between the ages of two and fourteen years, but they must not be served until they are three years of age. In the North-Western Provinces approved mares and fillies were, up to the year 1877, branded V. R. Since that date they have been branded V. I. In the Punjab and Baluchistan they used to be branded B. M., but are now branded V. I. as in the North-Western Provinces. The brand is usually applied on the near shoulder, but if the owner desires, it can be put on the saddle place.

A branded mare may be covered free of charge by any horse which the owner may select, in any district, provided that the horse selected has not served his full number of mares, and that his service is, at the time, available.

Branded mares covered by Government stallions for two years in succession without holding may, at the request of the owner, be struck off the register as barren: the owners are then given certificates allowing them to sell the mares, which may be purchased for remounts or by any Government official.

Covering fees.—The Government stallions are allowed to cover mares branded V. R., V. I., or B. M. gratis. No fees of any kind are to be given by or received from owners of branded mares. Zillahdars and stallion keepers are strictly forbidden to receive any fees directly or indirectly from the owners of such mares.

All European and Native owners of mares have the option of having them branded; those approved and branded will be exempted from any payment for covering. In the event of owners objecting to have their mares branded, a fee of Rs. 20 will be charged for each mare approved and covered, and the mare will only be covered if the services of a horse are available. The fee of Rs. 20 must be deposited with the officer in charge of the stallion before the mare is covered. In the case of branded mares, and unbranded ones requiring the services of a Government horse at the same time, preference will be given to the branded mare.

No unbranded mare may be served by a Government horse unless she comes up to the standard required by the Department, and is approved of.

Sickness of stallions.—In the event of a stallion becoming sick, or getting injured, all service should at once be stopped, and the horse put on low diet; that is, the gram ration should be withheld and bran substituted: a report of the occurrence should immediately be made to the officer in charge of the horses, who will send for the Veterinary Assistant and will report the matter to the Superintendent without delay. Should the sickness or injury be of a serious nature, and the horse be fit to be moved, he should, after consultation with the Superintendent, be brought in to the Depot hospital for treatment.

If a stallion be weak and out of condition, he should not be allowed to serve, and a report as to his condition should be made without delay to the Superintendent. The chief diseases with which the stallion is likely to be affected are derangements of the digestive system, and these are generally the result of over-feeding, want of exercise, and want of attention to the state of the bowels. To keep horses in good health the state of the bowels must be watched and regulated. They should be neither allowed to be constipated nor relaxed, and should they become either one or the other, remedies must be at once applied to stop the evil at its commencement. If the dung is hard and in small pellets, having the character of donkey's dung, the horse should be given bran mash and boiled linseed with little or no hay until the hardness disappears. If, on the contrary, the horse be purged, he should be kept without green food and grain, and fed on dry or nearly dry bran, rice cooage being given him to drink. When the horse is too highly fed and is kept without his proper amount of exercise, the liver becomes deranged, the horse is constipated, and, if this be allowed to continue, inflammation of the intestines results and he is lost. Officers in charge of Government horses should take care to see from time to time, that the colic drench provided is in good order and ready for use in case of emergency; they should also see that the enema pipe is serviceable.

MATING.

It is a generally admitted fact that the best time to take a mare which has produced a foal to the stallion is between the ninth and tenth day after foaling; and the best day as a rule is the ninth.

For proof that she has conceived, or held, as it is usually termed, the twenty-first day is generally selected to again

show her to the horse when, if she refuse him, it is concluded that she is in foal.

The Continental practice of having the mare covered twice with a short interval of a day or two between the coverings is the one adopted in this country. On this subject Day remarks, "I consider it best to allow two days to elapse between the coverings, as a mare may be stunted on the first covering, and, if this be the case, will often refuse the horse on the third day, and thus save him an extra covering."

With regard to the period of heat at which it is advisable to let the mare be covered, it is the custom in some parts of India at all events to wait until she is beginning to go off season. In this regard the same excellent authority above quoted remarks, "Try the mare on the seventh day after foaling, and every day after until she comes into use. If she does so, say, on the morning of the ninth day, then let her be tried on the evening of the tenth. If she be very much at use and can scarcely be brought away from the horse, do not let her be covered then, but try her again the next morning: if she be then at use, let her be covered on the evening of the eleventh day, but no more." This is done with a view of saving the stallion. It is usual to show the mare to the stallion on the ninth day after she has been covered, when if she be in heat, she must be again served.

The time of year when it is best to have the mare covered must depend on the time we wish to have the foal dropped. In most parts of India, I should say that the best time to have a foal dropped is towards the end of the cold weather, so that the young animal may have a chance of getting strong and hardy before the great heat of the summer comes on. If this be the case, the mare should be covered towards the end of February or at the beginning of March, but the native opinion seems to be that from the 15th of March to the 15th of May is the most suitable time in the Punjab. Some mares are also covered in October, November, but this is not considered to be so good a time. The native breeder is, however, rather careless in this matter and some covering goes on all the years round.

Some mares are very difficult to get into foal, and it requires a good deal of management to accomplish it. The Arabs rely greatly on exercise, and gallop their mares to excess before they are put to the stallion, so that they be fatigued and inclined to be quiet and rest. This mode of proceeding cannot be advocated with the excitable mares

cially the case when they do not get sufficient exercise. The mares which are most likely to produce the best and most healthy foals are those which perform a certain amount of daily work and receive suitable and sufficient food to keep them in condition. Very gross mares if kept too fat are very likely to be sterile.

Mares in this country are bred from between the ages of three to sixteen years, and probably produce their best foals between the ages of six and ten years. No mare may be covered by a Government stallion before she is three years of age. In England it is in some places customary to breed from two year old fillies, but such a proceeding is out of the question in India, and even in England it is deprecated by the most experienced breeders. Anyone acquainted with young stock in this country will admit the wisdom of not breeding from mares until they are over three years old. The young stock develop so slowly in this country that a three year old has not made the progress which a two year old has in England. The ancestors of the English horse have for many years been forced by high feeding and care, those of the Indian horse have for centuries been badly done, and treated on the worst possible system, and this probably explains the reason why they are so backward.

The result of breeding from young animals out here is the production of weakly stock. The best stock is thrown by young mares of five or six years old to a fully mature and robust stallion.

SEASON OR HEAT.

This a state of the system which occurs periodically in the mare and is characterized by an intense desire for the horse. The mare becomes very irritable and excited; switching the tail and attempts at micturition are frequent; but only a small quantity of urine is passed; there are often repeated movements of the vulva and clitoris, and a discharge of an opaque white secretion issues from the vulva. This state usually occurs in the spring, during the months of April, May (Chait and Baisakh). From the spring until the end of the summer to the month of Kartik it may be said that the mare evinces a desire for the horse every three or four weeks, and the period which it lasts is from two to five days, although it may last for fifteen days.

From my own experience and from that of experienced breeders I think it is certain that the mare will hold more

certainly when in a state of natural heat than she will when she has been teased into a condition of sexual excitement, which often is spurious, and only simulating regular heat. Many mares come into season during the rains, and during the cold weather but few.

There is a great deal of difference in the manner in which mares come into season: some scarcely manifest any sign, whilst others are a great nuisance, kicking and squealing whenever any one goes near them. Strange to say the quiet ones generally hold better than those which are more disturbed. Some mares are in a certain condition which renders them in a constant state of season, and these are to be avoided as they are only got into foal with great difficulty, and often not at all, whilst they are a continual nuisance.

It is sometimes necessary to bring a mare into season, and the usual way to do this is to place her in a box next to a stallion for a few days, or else to employ a teaser. In large breeding establishments it is customary to keep an animal especially for this purpose and it is usual, in such cases, to select a quiet, non-excitabie horse which can easily be kept in hand. In breeding establishments there is usually a barrier erected for the purpose of testing or teasing mares, and the use of this is to prevent the animals from injuring each other. In Yorkshire we generally use a five-barred gate for this purpose, and it answers very well, but in breeding establishments it is best to construct a mud wall, like a jump, with wings to it. In using it the mare is held on one side and the horse on the other, in such a way that the horse can smell and bite the mare. They are brought out to this barrier twice a day until the mare is brought into season.

In those cases in which the mare is in a continual state of heat she should be kept in a quiet place, and all grain food stopped: if possible, she should be kept on green food and have long, slow walking exercise. If she will not hold after a course of this treatment, we may try covering her twice in the same day, or better we may employ such drugs as bromide of potash and the like. If the result be still negative, nothing remains but to explore the vagina and the neck of the uterus, and to ascertain whether they are normal or not. It is often found that the neck of the uterus is so tightly contracted that nothing can pass it, and it is then necessary to use some means to keep it dilated during

covering, but this latter examination and dilatation require some skill, and a professional man should be employed to carry them out.

It sometimes happens that the mare does not come into season in the ordinary way although she is presented and shown to the stallion; this generally results from the mare being in bad condition. In these cases good stimulating food and some heating drug may be tried.

Sterility.—Temporary or permanent sterility is far from uncommon in the mare. It depends on numerous causes, some of which are removable, others not. It appears from the English stud book that in the case of thoroughbred mares 73·36 % carry foals. In France, at the Haras of Pompadour, the percentage of foalings amongst the Oriental horses bred there is 79·55. At the breeding establishment of Pin the average over a period of 20 years has been 68·27.

Prolonged continence, and old age, are not uncommon causes of sterility; this is often seen in mares which have been for a number of years in the ranks of regiments, or which have been running for a long time on the turf before they are sent to a breeding establishment.

Underfed and overfed mares do not generally breed so readily as those in moderate condition, and fat mares are notoriously sterile. Excitable, vicious mares are less likely to breed than are those of quiet disposition, which are generally filled after the first covering.

Besides these causes, there are certain diseases and conditions of the generative organs which give rise to sterility, and one of the most important, on account of its curability, is a closed condition of the canal leading from the vagina to the uterus: this is a very common cause, and when it is complete during covering, must be fatal to the mare holding, as nothing can pass it. It can be overcome by manipulation, and veterinary aid should therefore be sought in all cases of sterility.

This is a very serious matter to the breeder on account of the loss to which it gives rise, and as it usually shows itself during the first year of the mare's going to stud, she may, if she has had a fair chance of holding, be rejected for stud purposes: if, however, there is any reason to think that by judicious management she may be got into foal during the second year, as often occurs in racing mares, she should be given a chance. The rule regarding the sale of branded mares in the horse breeding department has very

wisely been relaxed a little so as to allow of the mare being sold to the cavalry or to any one else if she has been covered and found to be barren for two years in succession. Sterility may occasionally arise from the presence of painful wounds in the feet.

GESTATION.

This is the period during which the mare carries her foal.

Signs of gestation or pregnancy.—The signs which denote pregnancy are numerous, but are by no means to be implicitly relied on, and the chance of error in determining whether an animal is pregnant during the first six months is great. In some cases the difficulty of determining whether or not the mare is in foal is so great that she may go on till the period of foaling arrives without any suspicion of her condition being aroused, and indeed it occasionally happens that the mare is kept at her ordinary work and is moreover put to the horse again whilst she is carrying a foal. Instances in which premature labour has been brought on by the mare having been covered near her time are not at all uncommon. Up to the first six months the signs which announce gestation are very vague, one of the earliest being the cessation of heat. This is manifested soon after conception has taken place, by a diminution in the venereal excitement which marks the period of œstrum. If the horse approaches the mare at this time, far from showing any desire for him, she will most probably kick. In a general way then it is accepted that if the mare refuse the stallion soon after she has been covered, provided that she is in good condition, and well fed, and more particularly if she does so after a month or so has elapsed, she is in foal.

Unfortunately, however, this is by no means a certain sign, as some mares which have been pregnant for two or three months, especially if they have been covered in the early part of the year, come into season again as the weather gets warm.

Another sign which is often noticed is an alteration in the disposition of the mare, more especially in those which at ordinary times are vicious: these when in foal usually become more tractable and quiet.

The pregnant animal also has a tendency to improve in condition, but sweats readily after ordinary work, and is more sluggish than usual. These signs, although they are some-

times misleading, when they are noticed soon after the mare has been covered, are not so likely to lead us into error.

Later on in pregnancy certain physical signs are noticed, such as "dropping" or enlargement of the belly: the belly becomes enlarged at its inferior portion; the flanks seem to be hollow, and the back is dipped at the loins; at the same time the sides of the croup sink in and the haunches are very prominent. These changes become more marked as pregnancy progresses. They generally make their appearance about five or six months after covering. In the mare with her first foal the belly often shows little sign of enlargement until very shortly before foaling, and it is very difficult to decide whether she is in foal or not: others again, especially old mares which have had a number of foals, and have been kept at pasture, have more or less pot bellies, and it is difficult to perceive any increase in their size when they are in foal. If the other signs be taken into account with it, the swelling of the belly towards the sixth month after covering has a certain value. Another sign of some importance which must be taken into account is the enlargement of the mammae, which in the mare with her first foal generally commences three or four months after she has been covered. The udder becomes more prominent and loses its wrinkles: the swelling may go down completely only to reappear more markedly after some weeks have elapsed. Besides the swelling of the mammae, which may be taken as a positive sign, these glands furnish a yellow, viscid fluid towards the ninth month of pregnancy. When the mare has bred a number of foals this swelling only appears shortly before foaling.

About the seventh month certain other signs appear, and the most important of these is that we can detect the movements of the young creature by watching the abdomen, and may also feel its movements by applying pressure to the flank. Some little difficulty may be experienced in doing this if the mare be fidgetty. In order to make the examination properly, the mare should be examined as she is standing; the examiner stands to the left side, with his back towards the animal's head, applies the palm of the left hand to the belly immediately below the flank ten inches in front of the stifle, and just above the udder, pressing moderately the right hand resting on the back. In this way the movements of the young animal may be felt, or else a hard mass will be detected in the abdomen. The movements of the foetus are strongest in the morning, and are more distinct if the mother

be eating or drinking, and especially if the fodder or water be cold. Some authorities recommend that the mare be trotted, then placed in the stable and given some food, after which the movements of the foal will be more marked.

The state of the mare at the eleventh month usually is that the belly has much increased in size and become pendulous, the muscles of the croup have fallen in, and the haunches and the base of the tail appear more prominent, whilst the movements of the animal have become more sluggish. At this time also some oedematous swelling may appear under the belly and on the thighs; the mammary gland is swollen, and a yellowish material exudes from the teats and concretes on the nipple. At this period also a glairy discharge may appear from the vulva, and when these two signs appear foaling is very near at hand.

DURATION OF PREGNANCY.

The mare usually carries her foal for eleven months.

From observations made at the Middle Park Stud with regard to thoroughbred mares it appears that the majority of the foalings took place between the 340th and the 348th days, the time next in frequency being from 330 to 340 days. The duration of pregnancy appears to decrease with age, young mares carrying their foals longer than older ones.

It is commonly supposed that colt foals are carried longer than fillies, but this is by no means always so, for Cecil cites the case of one of his own mares which had eight foals, all fillies, and invariably went for from eight to fifteen days over her time. The experience of other breeders, however, goes some way to prove that the colt foal is carried longer than the filly. With regard to the influence of breed on the duration of pregnancy, the observations of Beaumeister and Rueff give us the following data:—In pure bred Persian mares the average was 341 days,—313 days for colts and 335 for fillies; in thoroughbred Arab mares the average was 338 days,—339 for colts and 337 for fillies; in highly bred Russian mares the average was $341\frac{1}{2}$ days,—341 for colts and 342 for fillies; in half bred English mares the average was $339\frac{1}{2}$ days, or 340 for colts and 339 for fillies. In the national Haras Pompadour the average period has been calculated to be 340 days, and I think that this is the most convenient time to work on.

CARE OF THE PREGNANT MARE.

When a mare is believed to be pregnant she should be kept away from the stallion. Exercise is very necessary for her, absolute idleness being bad for both mare and youngster and a fruitful cause of difficult foaling.

The pregnant mare will, with benefit to herself and her offspring, perform ordinary work very well until the seventh or eighth month of pregnancy, and more particularly so when the work is done at a slow pace. After the eighth or ninth month some little care as to the amount and nature of the work is necessary, although exercise is very necessary until the time of foaling arrives. If the mare be used for riding the use of spurs should not be allowed, and the pace at which she is taken must not be too violent: jumping and travelling over rough and uneven ground is often productive of harm. The best form of work at which the pregnant mare can be employed is harness work. In cases where not usefully employed in any way during the time, she must be exercised in hand, or turned out into a run or paddock where there is shelter from cold and bad weather; and she must, whilst there, of course, be properly fed and cared for.

Mares in foal must be well fed, more especially if they have to work or to suckle a foal at foot as well as carry one. The appetite is generally good and there is a tendency to put on flesh which must be somewhat guarded against, for if the mare is allowed to get too fat the development of the foetus is interfered with, difficult parturition may be brought about and abortion even result: the tendency to put on too much flesh must be particularly guarded against during the latter part of the period of pregnancy.

With regard to food, all that the breeder in this country can give is the ordinary ration, and this is generally sufficient to keep the mare in condition. It is not, as Day remarks, necessary to fatten them up like oxen for a show: neither should they be allowed to get into poor condition.

When mares are kept especially for breeding and are allowed to run in paddocks, they should not be exposed unnecessarily to the hot sun in the summer, but should be provided with a stable or shed into which they can go during the heat of the day. It is advisable not to allow them out too early in the morning in the cold weather, when the grass is covered with frost, as, if they eat this, it is likely to produce abortion.

ABORTION.

When pregnancy is interrupted by the casting of the young animal before it is sufficiently developed to live independently of its dam, abortion or slipping of the foal is said to have taken place. When the young is expelled at any time before the 300th day of pregnancy in the mare she is said to have aborted. It is more frequent in the first than in the second half of pregnancy. When it occurs at a very early period it usually causes but little disturbance to the health of the mare, and it may even pass unnoticed. It is, however, far more serious when it occurs at a later period. The causes which give rise to abortion are briefly :—bad cold, wet weather; excessive exertion following a period of complete rest, especially if there is any predisposition to it, may cause slipping of the foal; contusions to the belly by kicks or falls, or by squeezing through a narrow doorway or passage. Access to the stallion not infrequently causes it, as does also carrying a rider at a rapid pace over uneven ground and especially if he uses spurs. Excitement or fear may cause it. Certain smells are said to cause it.

Badly fed and neglected animals often miscarry, but not so frequently as those which are too fat. It is generally admitted that there is in some animals a predisposition to abort, and that, in such, a very trifling cause will induce it.

The accident generally shows itself early in the mare's career at the stud, and there is no doubt that it is advisable to get rid of any mare which slips, as it is pretty certain that if she once does it she will repeat the performance the next time she is pregnant, and as it is generally believed that the disease is catching, she may induce it in other mares and thus do much mischief. When a mare has slipped her foal, she must be separated from other mares in foal at once, and all the material which she has passed, together with the bedding which has been soiled by the discharges, must be burnt: the stable from which the mare has been taken should be thoroughly disinfected and cleansed, and it is advisable to keep it empty for some considerable time.

A mare which has aborted should be kept clean, fed on gruel and easily digested food, kept from draughts, and be nursed in any other way that may be thought necessary.

FOALING OR PARTURITION.

The date on which a mare is covered should be duly registered so that we may have some guide as to the time when

she may be expected to foal. About a fortnight before her time is up she should be taken into a comfortable, airy, and quiet loose box, if such a thing is available. Whenever possible, it is advisable to have a good roomy box set apart for mares to foal in. If such conveniences are not available, the stable which the mare usually occupies will have to be utilized for the purpose. The place, whatever it is, should be roomy and well ventilated, but free from draughts; it should be well-littered down with soft straw, bundles of which may also be placed around the walls; but it is very advisable to avoid putting fresh clean straw down at the time when the mare is expected to foal, as mares at this time have often a morbid appetite and may eat an excessive quantity of bedding, distending themselves to a dangerous extent. Food and water should be given in small quantities to mares when they are expected to foal.

The date on which a mare ought to foal will, as a rule, be a good guide as to when that event will happen, but, as has already been stated, it is not always very correct, as some go a little beyond their time, whilst others are some days before it, and hence it is that it is advisable to make preparations about a fortnight before the event is expected. The mare should be seen very often, as the time gets very near, she should be watched, and, as the time may have to be given to her either during or after the event. Want of attention and watchfulness at this time has been the cause of the loss of many a valuable foal. It is advisable for the person who is set to watch to keep out of sight as much as possible and not to bother the mare at all, as some mares are very irritable and fidgetty at this time and are easily annoyed when anyone is near them at foaling time.

The signs which immediately precede foaling are briefly as follows:—One of the most important signs is the enlargement of the mammae to which the excess of blood, no longer required for the foal, is directed. These glands become enlarged, hard and tender, and the development is sometimes so considerable that the swelling extends under the belly. The teat yields a serous fluid on pressure, or this escapes and forms a crust around the nipple. Another sign is swelling of the vulva, increase of the space between its lips, which become soft and flabby; the lining membrane being red and covered with a glairy mucus. The croup looks very hollow, as do also the haunches and flanks. The animal moves sluggishly and the limbs sometimes swell.

When about to foal the mare becomes restless and uneasy, lies down and rises again as though she were attacked with colic, and makes expulsive efforts. The mare usually foals in the standing position, but she may occasionally do so lying down. The labour continuing, the lips of the vulva part, and the water bag makes its appearance; this structure has the appearance of a bag filled with water. Following the contractions of the uterus and the abdominal muscles, this bag having been pushed out considerably, is at length ruptured and discharges a glairy fluid, which lubricates the passages, and makes the passage of the foal through them far easier than it otherwise would be. Then if the foaling be normal, we perceive the fore feet of the foal, with the nose resting on them, make their appearance. When the foal comes in this position there is, as a rule, very little trouble, and the foaling is quickly and easily over. The time which the act of foaling occupies is, of course, very variable, but it is usually brief, not lasting more than five or ten minutes, though it may extend to half an hour in some cases.

CARE OF THE DAM AFTER FOALING.

In ordinary circumstances, when the mare is vigorous and not much fatigued, nothing more than cleanness, good food, and comfort are necessary. She should be kept out of draughts after foaling, as at this time she is very susceptible to cold. If she has been perspiring she should be well rubbed over with a wisp, especially over the abdomen: then clothed up, if the weather be chilly, for the first four or five days.

About a gallon of good linseed gruel, or a bran mash, some boiled barley or oats, given warm, with some salt in it may be given to her at once; she may be afterwards littered down with soft bedding and when the foal has been introduced to her and allowed to suck, she may be left for a couple of hours, then visited again and some more gruel offered to her. During the first few days after foaling the mare is to be left quietly with the foal, her food, during this time, being nutritious, and easy of digestion. She should be allowed a rest of at least fifteen days in order that lactation may be well established.

The afterbirth, or cleansing, which consists of the foetal envelopes, is either discharged within the first two days after foaling, or is retained; the first is the more common occur-

rence, it being rare for them to be retained in the mare. When the afterbirth comes away naturally it should be at once removed, and buried at some place to which mares in foal have not access, as it is dangerous for them to smell it. If, as may happen, the cleansing does not come away soon after the delivery of the mare, the best thing to do is to pull on it till it fail to remove it, the best thing to do is to attach a small weight, of about half a pound, to the part which hangs out: this not only prevents it being drawn into the passages again, which would be rather a serious matter, but at the same time, by exercising continuous and gentle traction on it, helps very much to loosen it and bring it away. It should be gently pulled on occasionally, so as to help its removal, and if after a couple of days it still remain adherent, it is advisable to remove it by hand. One way in which this may be done in the mare is to seize the membranes in a cloth and pull on them, more especially when the mare strains. It is very advisable to prevent the membranes from putrefying in the passages as, if this occurs, there is danger to the mare from blood poisoning. If any putrefaction has taken place, the parts must be washed out with a solution of permanganate of potash or a solution of borax.

When parturition has been protracted and the animal has suffered much, nursing must be continued longer, and if the animal is old or weak, stimulants and nourishing food must be given. Occasionally the udder is much distended with milk and is very painful: in this case a little of the milk must be drawn off before the foal is allowed to suck. Young mares with their first foals are very often frightened and will have nothing to do with their foals, especially when people are present. In such cases it is necessary to use every effort to quieten the mare, and to prevent people from going into the box with them. It is a good plan to leave the mare and foal together for a time, so that they may make each other's acquaintance, and the mare take to the foal. At other times the mare is really vicious to the foal and when this is the case it is necessary to hold her, and even in some cases to have her foot held up, whilst the foal is taken to the teat and allowed to suck.

CARE OF THE FOAL AFTER FOALING.

The first thing demanding our attention after the birth of the foal is the umbilical cord or navel string. This is usu-

ally ruptured during the act of foaling, as the mare generally performs this act in a standing position, but if she should foal lying down, the cord will be broken when the mare rises, which she usually does immediately after foaling. When, however, the mare, from weakness or any other cause, foals lying down, and does not rise, it becomes necessary to divide the cord. This is best accomplished by applying a ligature to the cord in two places, one near the belly of the foal and the other an inch or two away, the cord being divided between the two ligatures; the part selected for severing may be a couple of inches away from the foal's belly, but the ligature should be as near as convenient so that the cord will eventually remain at the length at which it would be when naturally torn.

The next thing to do is to ascertain whether the foal is breathing naturally. In some cases it appears to be dead, and does not breathe, although it may still be alive. In these cases no time should be lost in inducing it to respire. The mouth should be washed out with cold water, and the nostrils and face sponged over. Dashing cold water over the chest very often induces an inspiration, which starts the mechanism to work. Rubbing the foal's body, tickling the tongue with the finger, or the nostrils with a feather, blowing tobacco smoke into the nostrils sometimes are successful and may be tried. When these means fail artificial movements of respiration may be carried out, the fore legs being pulled forwards and slightly apart, and then slowly pressed backwards and inwards, some pressure being made over the ribs. Once the mechanism is started, as a rule, all is well. The life of the animal should not be despaired of until the heart ceases to beat.

The foetal envelopes are very tough in the mare, and it sometimes happens that the foal is born without them being ruptured. When this happens no time should be lost in freeing the young animal from them, as otherwise it will undoubtedly quickly perish from suffocation; when the water bag does not rupture therefore, it should be cut into.

When the hind feet of the foal are born first, there is great danger of the foal being suffocated, if the birth is protracted, and no time should be lost in freeing the young animal from any of the membranes which may be about it: the whitish material must be removed from the mouth and nose with as little delay as possible, otherwise the foal will be suffocated at his first inspiration. The next thing to do

is to ascertain whether the natural orifices of the body of the young animal are all right, as it sometimes happens that one or other of them are closed by a fold of skin, which must be divided carefully by a cross-shaped cut, care being taken to avoid injuring the neighbouring tissues.

As a general rule, the mare licks the foal free from the mucus with which it is covered, and this is beneficial, as it stimulates the circulation of blood in the skin. When this is the case, and the foal has commenced to suck, very little interference is either necessary or desirable. Should the mare, however, through fear or from any other cause refuse to lick the foal dry, it is advisable to endeavour to induce her to do so by sprinkling a little sugar, flour, or salt over the foal's back. If these inducements fail, the foal must be dried with a soft hay wisp, cloth, or better than all, perhaps, be rubbed with dry bran which forms a good material for the purpose. This is the more necessary when the mare is indifferent to the foal, as occasionally happens if it is her first, and especially when she is put out by a number of people being about her. Some mares become quite savage, and will not allow the foal to come near them. When the mare shows aversion to the foal it is best to leave them together.

Shortly after birth the first impulse of the foal is to get on to his legs, and this he generally manages to do after a few attempts, and totters to his mother's side, instinctively seeking the teat as a rule: many foals, however, and especially weakly ones, have to be assisted to rise and shown the teat several times before they can find it for themselves. It is customary to assist the foal to stand, and to conduct it to the mother's side for the first time, putting the teat into its mouth and assisting it to stand whilst it sucks a little: it is wonderful what a stimulating effect a few mouthfuls of milk seem to have on the foal.

There is a most pernicious practice in vogue in this country among the native breeders: I allude to the deprivation of the first milk given by the mare, from the foal, on the ground that it causes purging. During the time that the foal has been carried the waste materials of his body have been accumulating in the intestine, and for the purpose of clearing all this out, nature has arranged that the first milk of the mare should be of such a nature that it will cause slight purgation. There is no commoner disease amongst foals than constipation, even when the

animal is allowed to drink the first milk, and the tendency to this disorder is, of course, much increased if the colostrum be deprived from the animal. Should the foal be constipated, in spite of the first milk, it is to be given a small dose of about four ounces of castor oil, or the same quantity of butter, melted and given warm: the old English dodge was to place a small tallow candle in the rectum, and this was handy and generally had the desired effect: in this country we should be bothered to find such a thing as a tallow candle, but soap has the same effect.

At birth the feet of the foal are covered with soft yellow horn which it is, in some parts, the custom to remove under the impression that the future horn will be harder in consequence. This is a mistaken idea, as it is, as a matter of fact, injurious to remove it.

The following remarks on the management of the foal by the Arabs of the Sahara may be of interest: When a foal is born it is usually not allowed to fall to the ground but is caught in the arms, and the person who catches it walks about with it, often in the midst of a great noise and uproar. It is supposed that a useful lesson is thus taught for the future. To teach the foal to suck, a fig or date soaked in milk and slightly salted is put into his mouth. As soon as he takes a liking to it and begins to suck he is placed under his dam. After this he is carefully preserved from the night cold. It is necessary to accustom him to drink camel's milk, as it will form his chief diet for a considerable time, and which he may often have to drink in place of water. In order to do this they take a goat skin which has been used for several years for holding milk, and fill it with air, and, squeezing it gently, they blow the air up the nostrils of the foal a few times. They crush dates in milk and dip the foal's mouth into it occasionally: he begins by licking a little from his lips, and eventually drinks it whether the dam is suckling him or not. Great importance is attached to teaching the foal to drink milk: first, because he can be left in the tent whilst the mare is at work: and secondly, because in after years in default of water he will be satisfied with milk instead.

SUCKLING.

The foal may be fed on milk in three ways:—it may be suckled by the dam: it may have a foster mother: or it may be hand-fed on milk.

The foal is usually nourished on milk until it is six months old, and during this period it is necessary to give some attention to both the mare and the foal.

Care of the foal.—During the first few days after foaling, the mare's milk is of a yellowish colour, and more serous in character than it is later on. It is named "colostrum." This first milk of the dam contains a substance which is destined to stimulate the digestive tube of the newly born animal, and to remove the greenish coloured excrement, which is known as "meconium" from the intestines. It is therefore wrong to deprive the foal of it.

Foals are much subject to constipation and diarrhoea. In the first case we may use the means indicated under foaling, and in the latter we may beneficially give rice water or starch gruel.

Diarrhoea is a very serious disease in foals, and should be guarded against by keeping them and their dams in healthy places and comfortable. When it appears, it must be checked immediately by the administration of a dose of castor oil given in a little milk or gruel, and afterwards a small dose of alkaline medicine such as bicarbonate or bicarbonate of soda, a drachm with 15 drops of tincture of opium, chlorodyne or tincture of iron. A dram of alum given in water with five drops of tincture of opium is often found to be very serviceable. The foal must be kept warm.

As the mare's milk may often be the cause of the disease, the foal should be kept from her, except at short intervals, and her diet should be changed, tonic and alkaline medicine being beneficial to both mare and foal. It will be found a good plan to prevent it to throw a handful of lime into the water-troughs occasionally. When the mare has too much milk, as sometimes happens, the precaution of milking her should be taken, a part being removed so that milk indigestion, a very severe disorder in the foal, may be prevented.

The foal should not be allowed to suck when the mare is overheated and in a state of perspiration, as the milk at that time is said to cause diarrhoea, and, at any rate, is very likely to disagree with the foal and cause a troublesome form of skin disease. When the mare has become much overheated she should be allowed to cool down, and the udder should be bathed with cold water before the foal is allowed to suck.

Another cause of diarrhoea in the foal is milk deficient in nutritive properties, due to the mare being a bad nourishing

one. The foal under such a mare will be in bad condition and wasted. In such cases attention must be paid to the food of the mare: she should be specially well-fed and a ration of boiled barley will be found very useful in these cases. The foal must be partially hand-fed and encouraged to feed on ordinary food, such as boiled linseed, barley, etc.; early weaning must be carried out.

Towards the second month of its age we may try to get the foal to take a little grain; in fact the opinion of some of the most experienced breeders is that we cannot too early induce the foal to eat grain if we wish it to become of good size and strength.

Generally the foal will be noticed to eat a little of its dam's food at the age of a month or so, and this inclination should be by every means encouraged, especially when the foal reaches the age of 3 or 4 months, when it should have a portion of grain set aside for itself: to prevent the dam eating this when she has finished her own she may be tied up so that she cannot get at it, or, if at pasture, a separate trough for the foal, surrounded by a fence which will prevent the mare getting at it, but high enough for the foal to get under, should be erected. When the foal has commenced to eat grain, the amount allowed should be gradually increased until at the age of six months it takes the full ration necessary at this time, or about $1\frac{1}{2}$ lbs. to 2 lbs. daily.

In order to allow of the young animal digesting the full ration of grain it is necessary to give small feeds at frequent intervals: and to the ration should be added some green food, if procurable. As soon as the foal eats this, it is advisable to allow it to go out to pasture if the time of year be favorable. Care should be taken not to expose the foal to wet, especially in the cold weather, as it has a particularly injurious effect upon it. The woolly texture of the coat of the foal is of such a nature that it takes a very long time to dry, and chills are very likely to follow a wetting.

The first time a foal is allowed to go out of the stable to pasture with its dam certain precautions should be taken. Towards the ninth or tenth day, a suitable time having been chosen, a man is to lead the dam out of the stable: if the foal does not follow, two assistants, one on each side, direct the foal out of the box. It will often remain immovable at first when it is let go in the open air, but soon becomes accustomed to the bright light and commences to

run about: the mother is then led on in front at a slow pace, the foal accompanying her. From time to time the mare is stopped, and the foal is allowed to suck a little milk. The exercise should, at first, only extend over an hour or two during the day, and when it is terminated the pair are taken into the stable again.

The next time the mare is taken out the foal follows her well.

This exercise has a very beneficial effect on the foal as it takes fresh air and develops its muscles. In Northern India if foaled in February or March, foals may be turned out as soon as the spring grass is worth grazing on. As it gets hotter, they are turned out and brought in earlier in the morning and then let out again when it has become cool in the afternoon for two or three hours.

SUCKLING BY A FOSTER MOTHER.

In wholesome mothers' milk generally lies the decision of the whole question whether a foal will develop into a good horse or become a miserable weakling. Insignificant foals frequently develop with incredible rapidity at foot of a dam with exceptionally good milk, whilst some mares will, season after season, throw magnificent foals which, during suckling time, collapse, and melt away like butter in the sun. Jack Spigot was a very good example of this: he was all to pieces before Mr. Powlett gave him to a tenant to allow his mare to bring up the colt, and he thrived so well under his foster dam that he turned out a capital horse and a Leger winner. If it be possible, then, it is advisable that foals be removed from bad nourishing mares and put to nurses with a good milk supply. In the majority of cases in this country, however, this is not possible, and the utmost that can be done is to supplement the mother's milk with camel's, buffaloe's, or cow's milk.

When the foal has lost its dam we often have recourse to a foster mother if such a thing is available.

Having chosen a nurse, it is necessary to accustom the mare to the foal and this requires a little management: in the first place it should be arranged that the foal is not brought to the mare until she has a good deal of milk accumulated in the gland, and has a desire to be relieved of it, care of course being taken to see that the accumulation is not allowed to go too far and the gland to become over-filled and painful. When the mare is in this condition of

feeling the want of relief from the milk, and the foal is hungry, there is generally less trouble in introducing them as each feels the want of the other.

Lehndorf suggests that as the mare recognises her foal by smell it is a good plan to smear a little anisced oil on to it so as to deceive the mare. When it is a question of exchanging foals this is doubtless a very useful plan and may be carried out as follows: a little oil is to be rubbed into the coat of the two foals for a few days until the mare gets accustomed to the smell; the foals are then removed from their dams and kept away until a quantity of milk has accumulated in the gland: the foals are then changed, the boxes having been previously darkened a little. When the foal is brought to suck for the first time, it is of course necessary to see that the mare does it no injury and she should be kept in hand: care should also be taken to see that she takes to it, and if she does not, it must not be left alone with her or she may kill it: the best thing to do is to put it in a stall close to her so that she can become accustomed to it, taking it to suck as may be necessary, the mare being held during the process: if this be done, she will, as a rule, take to it in time and become friendly to it.

ARTIFICIAL LACTATION OR FEEDING BY HAND.

Artificial lactation means the rearing of the foal with the milk of another mare or that of some other animal, fed to it from a bucket. The milk of several kinds of animals may be employed for this purpose: the Arabs use camel's milk which appears to be very useful, and they consider it preferable to the milk of the she goat or of the ewe, which they think produce laziness in the foal. Camel's milk indeed forms the chief food of the Arabian foal for the greater part of the time he is being reared as he is weaned at the second month and given nothing but it: this may be tried in all those parts of India in the case of valuable foals, and especially those having much Arab blood in them where camel's milk is procurable in any quantity. It is customary in certain parts of the Punjab, Montgomery for instance, to supplement the mare's milk with camel's milk sweetened with goor (sugar). It is given in small quantities at first, but afterwards almost *ad lib*, foals getting being fond of it. The method of teaching them to drink it has already been noticed. It is believed that the milk of the camel has the particular property of imparting speed, so that a man,

according to what is stated by reliable persons, if he take nothing else for a time, will attain such a degree of swiftness that he may vie with camels: in fact camel's milk strengthens the brain and tendons and does away with fat.

In England it is customary to employ cow's milk properly diluted with water in the proportion of two parts of milk to one of water and sweetened with a little sugar: but even on the good cow's milk to be obtained in England it sometimes happens that the foal will not thrive, and Reynolds recommends an excellent substitute in beans, well boiled, the husks removed, and the remainder passed through a sieve and mixed to the consistency of cream. A dose of castor oil to the amount of two ounces may be occasionally required by the foal so fed, as constipation is not infrequent. The milk of the ass is a very efficient substitute for mare's milk if available. In India the milk of the buffalo, which is far richer than cow's milk, may be used after it has been diluted and sweetened. When the dam dies it must not be forgotten that every effort is to be made to induce the foal to take manger food as soon as possible. This should consist of succulent boiled barley, or oats if procurable, to which a little salt has been added, and linseed tea made thin to drink. There is little difficulty in getting a foal to take milk from a pail if we go the right way about it. The proper way is to place a little milk in the pail, and then dip the hand into it making the fingers meet in the form of a cone and projecting the tips well above the fluid: these the foal will readily suck if they be put into his mouth and in doing so he will take up some of the milk. After a very short time he will drink by himself, and care must then be taken to prevent him drinking too quickly and getting indigestion. None of the methods of rearing succeed so well as natural lactation and the produce artificially reared is seldom as good as that reared by the dam. Yet some horses which have been reared in this way turn out remarkably well eventually. Saucebox is a horse which I can call to mind at the present moment, which, when his dam, Priscilla Tomboy, died, had his milk from a teapot. Yet he turned out a wonderfully good horse and won some fine races, including the St. Leger and the Lincolnshire Handicap.

CARE OF THE DAM DURING SUCKLING.

When lactation is well established it is necessary to nourish the mare well. If she be in good milking condi-

tion and strong, two moderate feeds of grain a day will be sufficient, provided that she has plenty of good grass by day and hay by night. When brood mares are suckling and they cannot be sent out to pasture they must receive, if possible, good green food and hay, boiled barley, carrots, and, if obtainable, scalded oats, with an abundant supply of water.

Attention must be given to the udders of suckling mares as they are liable to get hard and inflamed. When the udder does get hot and painful care must be given to it, as it is a dangerous thing and likely to lead to bad consequences if it be not relieved. If the gland be very hot, painful and inflamed, veterinary advice should be taken, otherwise there is danger of the udder being destroyed : but if it be slight, warm fomentations of bran and water, and gentle friction with the same, with frequent milking will probably quickly remove it. A changed or reduced diet will in some cases be necessary : but, unless the foal can be taken away from the mother, no physic or other medicine should be given to her as it is likely to injure the foal.

When the mare has too much milk, or when she returns from work after an absence of some duration, partial milking must not be neglected, especially when the teats are much distended, as if the foal is allowed unlimited access to it soon after birth, its digestion may become deranged. Some mares, more particularly those with their first foals, do not yield enough milk to nourish the foal. In such cases the mammary gland must be frequently stimulated by the foal and then submitted to gentle friction by the hand, and a plentiful supply of green food, succulent and easy of digestion, must be allowed. In the absence of green food, boiled barley made into a mash with the addition of a little gur or treacle and salt is a palatable nourishing diet tending to increase the secretion of milk ; and linseed gruel may be frequently given with benefit. If these means fail to excite a sufficient flow of milk, the foal must be periodically suckled by a foster mother, or else artificially nourished on cow's, camel's or buffaloe's milk. If the mare has been at pasture before foaling she may return to it after five or six days if the season of the year be favorable ; but before even moderate work is required of her she must have at least three weeks' rest, and then food in proportion to the amount of work must be given : the work should be neither fast nor heavy, and the mare should not be kept for many hours at a time from the foal.

The mare should pass the greater part of her time at pasture if possible, but in any case she should be as much as possible in the open air. It is better to keep the mare and foal apart from others at first, either in a small paddock, or, when this is not available, in a small enclosure, so that the exercise they take will be sufficient to keep them in health, and that the foal may learn to follow the dam about and not get injured by losing its mother and getting kicked by other mares when they are turned out into the common pasture. If no other exercise can be given, and the mare is not used for work, as is often the case in this country, the pair may be turned out on to the village common or into the fields to graze during a part of the day, the mare being hobbled if necessary.

In this country the only work expected from the mare is usually saddle work, and, in the event of there being no paddocks or other convenience for turning them loose, the foal may with advantage follow the mare when she is ridden, care of course being taken that the pace is not too fast and that the foal be not overdone. Exercise taken in this way is of the greatest benefit to both the mare and foal.

GOOD AND BAD POINTS IN THE FOAL.

Conformation.—At birth the produce presents an awkward appearance, but we must not take the exterior characters which the various regions may offer for defects, although they may appear to have the greatest resemblance to them. The following are briefly the good and bad points to be noted in the foal at this age.

Good conformation.—In general appearance the foal is large and vivacious, the head is large at its superior part and is well set on, the forehead is slightly rounded or bulging, the face straight and short, the eye well open. The neck is long and carried in a more or less horizontal position. Withers sloping backwards; line of the back in the dorso-lumbar region somewhat arched and well coupled to the croup; hips prominent; tail well set on; chest large, deep and rounded behind the elbows; ribs long and arched; belly round, limbs well under the centre of gravity, but a considerable distance should intervene between the point of the shoulder and the buttock.

Fore limbs.—Shoulder sloping, with the point prominent; elbow prominent, and parallel to the axis of the body; fore arm large at its superior part; knee large and thick

with no deviation either inwards or outwards; cannon bone large; tendons well defined and standing well away from the bone; fetlock thick and large; coronet and foot large, horn of the hoof black.

Hind limbs.—Croup a little oblique, but muscular, large and long; haunch strong; thigh long and very muscular; hock long, large and thick, but clean and with no deviation either inwards or outwards.

Such is the pure bred foal at the time of its birth and suckling. It may be remarked that half and coarse bred foals are generally more regular in their form than thorough-breds are.

BAD POINTS IN THE FOAL.

Head too large; ears inclined to be drooping; neck short; withers inclining too far forward; line of the back straight or concave, long and drooping at the croup, the tail being set on too low down; chest narrow and lacking depth; sides flat and ribs short.

Limbs not well under the body, but in spite of this the animal not standing over much ground. Shoulder straight; elbow tied in; fore arm small; knee small and deviating from the straight line; cannon small, tendon not standing away from the bone; fetlocks small and round; foot small and the hoof horn white.

Croup very oblique and short; thigh lacking muscular development; hock small and mean.

These are all bad points, and the presence of any one of them is an index that the foal will grow up an indifferent horse.

WEANING.

By weaning is meant the separation of the foal from the dam, and the withholding of the mother's milk, or the cessation of suckling. The foal should, as a general rule, be weaned at the age of six months, as after this time the milk of the mother is no longer proper food for it. No hard and fast rule can, however, be laid down as to the proper time for weaning, as it depends a good deal on circumstances. In the first place, it will depend on the quantity and quality of the milk which the dam affords; also whether she is required for work or not, and, if so, whether the work is to be hard or light. When the quantity of milk which the dam affords is large and the quality good, the foal may be

kept with her for a longer period, and more especially if she is not required for work but is kept especially for brood, and is not again in foal. In these cases the foal may, if it be desired, be kept with the dam until natural weaning is effected, but if she is again carrying a foal I do not advocate the foal being kept with her unless she is in first class condition.

If, on the other hand, the quantity and quality of the milk is deficient, the foal gains little benefit from being kept with the dam any longer than is absolutely necessary, and the dam, if in poor condition, is much benefitted when the foal is weaned early.

When the foal is weaned early it should be given some milk from the pail.

It may be remarked that the Bedouins allow the foal to remain with the mother for only thirty days, after which they wean and rear it on camel's milk.

Weaning may be accomplished in three different ways:—(1) naturally, (2) gradually, (3) suddenly.

1. *Natural weaning.*—When the foal is allowed to go to pasture with the dam she generally ceases to allow it to suck after it has reached the age of from eight to ten months, especially if she is again in foal. At this time the mother has, as a rule, but little milk and that is of inferior quality, while at the same time the foal grazes and eats manger food, so that it has little desire to suck.

2. *Gradual weaning.*—According to this system we commence operations by gradually separating the foal and the dam for about a fortnight before actual weaning is carried out, so that the foal is allowed to suck at first three times a day, then twice and once until complete separation is carried out. This method has much to recommend it, and is attended with the least inconvenience to both dam and foal. The secretion of milk gradually decreases in the mare and there is far less danger of engorgement of the mammary gland with milk and inflammation of that organ occurring. It is the one adopted by the Arabs of the Sahara who remove the foal from its dam first for one day, then for two and so on, gradually increasing the period of separation. To render the transition less abrupt, they give the foal camel's milk sweetened with honey.

3. *Weaning suddenly.*—By this is meant the sudden separation of the foal and dam.

When the foal is weaned it is advisable to put it into a secure and comfortable loose box, with others for company if there are any, and it should be kept there for some days until it has forgotten its dam. The separated dams and foals should be kept at a sufficient distance to prevent them hearing each other neighing, otherwise they will both be restless and fretful, and their health will suffer in consequence.

The foal soon forgets its dam and loses all affection for her, and she for it, when they are separated, but during the first two or three days following weaning the foal is very restless, constantly moving about in the box and continually neighing. It will be found advantageous to visit it occasionally, to talk to and pat it, and give it a little food to eat or a piece of salt to lick.

FEEDING.

The feeding of the foal at this time requires a good deal of attention as it must be supplied with varied appetising fodder such as will produce muscle and bone. We must never lose sight of the fact that the future muscle and bone goes in at the mouth in the form of good fodder, and that stinting the foal is bad policy. The animal must therefore be well fed, but care should be taken to guard against overfeeding which induces obesity. At the same time we must guard against loss of condition resulting in the loss of the foal's flesh which is a very serious matter. It is only too well known to breeders that when foals miss a good start at the commencement of their life, and sustain a check to their growth, it generally requires much time and nursing to repair the damage; indeed, sometimes the effect is so serious that their vigor and full development are permanently arrested. Green food is very beneficial at this time, but it must neither be too old nor too young: when it is too old it is difficult to masticate, and the foal is likely to refuse to eat it or, if he does eat it, there is danger of intestinal disorders being caused: when it is too young it is likely to set up diarrhoea. Bran mashes are very good for young stock and may be given whenever the state of the bowels indicates the necessity or the advisability. Linseed gruel made thin is very good for young stock. Plenty of good grain and hay must be provided as a staple. The Arabs give ground barley as a staple in increasing quantities, as required, excepting in Nedjd where the young stock get dates and

water made into a paste and grazing. In parts of the Punjab gram soaked milk and camel milk are occasionally given after weaning for a few months. Jowar (sorghum vulgare) and moth (phaseolus acoititifolius) are considered good grains for growing foals. In Baluchistan jowar is given. The following scale of grain ration will be found useful as a guide in this country.

At weaning	.	.	.	.	.	.	1 seer.
1 year	.	.	.	.	.	.	1½ seers.
1½ years	.	.	.	.	.	.	2 seers.
2 years	.	.	.	.	.	.	2½ seers.
2½ years	.	.	.	.	.	.	3 seers.

No hard-and-fast rule can, of course, be laid down, as so much depends on the size of the stock, the amount of exercise they get, whether they are good doers or not, as well as on the amount of fodder they get besides. The grazing in this country is, for the most part, very inferior, and it is necessary to supplement it with green food, such as lucerne, and guinea grass (which may be chopped up with the hay), carrots, green barley and oats in the spring from February to March; and oats in straw chopped into chaff with hay does very well for the night ration. It must be borne in mind that the foal requires to be fed oftener than the adult animal does and at least four times a day is the usual allowance for it.

A few days must be allowed to elapse after the foals have been taken from their dams before they are let out into the paddock, or let loose, so that they may have become reconciled to the separation. They should, at first, be let out for a short time only (an hour or two to begin with), and it is advisable to watch them for the first few days, to see that they do not get into mischief. With regard to turning the youngsters out to graze or allowing them their freedom in this country, it is not deemed good practice to allow them to be out in the sun when it is very hot, nor out in rainy weather or on cold nights, nor to turn them out early in the morning when the dew is on the ground. It sometimes happens that one youngster at pasture becomes a bully, and, by constantly harassing another, hinders it from feeding, and, by chasing it, causes it to take more exercise than is good for it; such an animal should be separated from others. Sometimes two youngsters contract the habit of sucking various parts of each other's bodies, and in this case it is necessary to separate them.

TREATMENT OF THE MARE WHEN THE FOAL IS WEANED.

The usual time for weaning is when the foal is six months old, when, if the mare has conceived again, or is about to be severely worked, it is to her benefit that the separation should be no longer delayed. The chief matter to be attended to in regard to the mare is to dry up the milk as soon as possible, and in the meantime to prevent its accumulation in the mammary gland, as if this be not done the glands become distended with milk and inflammation may result. If the secretion of milk be not excessive and more particularly if the weaning has been gradually carried out, there is, as a rule, little bother, and all that need be done is to curtail the food of the mare, giving entirely dry food, and to remove such milk as may accumulate, by hand. As has been said in another place, the separation of foals from freely nourishing mares must be cautiously carried out, and the best method of doing it is to adopt that form of weaning which we have designated gradual weaning. If the secretion of milk be very troublesome, the intervals of allowing the foal to suck must be gradually lengthened. The mare must be put on low diet and have a good deal of work.

After actual weaning has taken place the mare should be periodically milked, and if there be a tendency to the deposit of milk in the mammary gland a little spirit or ghi may be rubbed into the gland: the diet must be dry and restricted, and a brisk purgative may be given. If these means fail to have the desired effect, we must withhold all succulent food, give nitrate of potash in the drinking water, bathe the glands occasionally with cold water, and give alum in dram doses, or better, extract of belladonna in dram doses internally, and apply an ointment of the extract to the gland. Small doses of camphor have been recommended as very effective. Mares which are kept only for brood, if in good condition and not enfeebled by age or other circumstances, may continue to suckle their foals until natural weaning takes place and the milk secretion ceases. I think it is not a bad practice in this country, where the stock is as a rule so backward under the most favourable conditions, not to wean until the dam is well on with her next foal, especially if the colt be at all weak. In some cases where the mare has been at all irritable or fractious, the foal has been left with her until a few days of her time for foaling again, and it seems that practical breeders in this country are

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against taking the foal away from the mare as early as we do in England.

EXERCISE FOR YOUNG STOCK.

Exercise is quite as necessary for the future well-being of the young animal as is good food. The following remarks by Day are so important and to the point that I cannot refrain from reproducing them here; he writes:—"Of all the mistakes made in the management of yearlings, that of allowing them too little exercise is not the least. To put them into small paddocks, totally unfitted for rearing young stock, is a sad blunder. Whether it is a foal, a yearling, or an older animal, the young horse requires plenty of room for exercise. This is necessary in order that its natural powers may be properly developed, its frame built up, and that in a small paddock? And how can this be effected if the animal only gets an hour's exercise in the day and that in a small paddock? And worse still how can it be effected if the young horse is never allowed out of its box or hovel, where, possibly, it is kept in close confinement until it is sold? But no one will pretend that yearlings can be reared in such an injudicious way. Rather all breeders and stud grooms know the desirability, the necessity, of plenty of open air exercise, and are ready to expatiate on its advantages."

Too much stress can scarcely be laid on this subject of exercise for young stock. "The practice adopted of trying to rear young stock in loose boxes is too preposterous to admit of any argument. When the weather is favorable, foals at this age must have their freedom. If this be not allowed, the animal unaccustomed to the free use of its limbs cannot generate in its growth that volume of muscle provided by nature for the purpose of giving it energetic motion," says Cecil. Deprived of the means of exercise, sinews, muscles and joints cannot acquire that texture so important. A certain amount of exercise and fresh air is also essential for the promotion of digestion. The consequence is that animals which have been reared in a state of confinement, have misshapen limbs and give way in their joints or sinews when they are put to hard work. To establish vigorous health, every animal requires exercise in proportion to its age.

One of the greatest evils attending horse breeding in this country is neglect of giving plenty of open air exercise

to the young stock. The reason why so many of the young stock bred and reared by the native breeder have narrow shallow chests, mean hind quarters and crooked legs, with undeveloped joints and bones, is that they have been tied up by the head and heels, and have not been allowed proper liberty. As a matter of fact young stock should on no account be tied up in any way, excepting during feeding time and in the stable, when a number of them are kept together.

So great is the evil attending want of exercise that the Government have been obliged to establish farms where young stock purchased from the breeders can be properly reared at liberty in spacious paddocks and become sufficiently developed to turn out remounts for the Army. No one can fail to be struck by the difference between a horse reared on the liberty system and one which has been reared in confinement; the one is misshapen, with crooked legs, small limbs and joints, heavy fleshy carcase lacking muscular development, and having a bad constitution: whilst the other is probably sound, shapely, but at any rate has well developed limbs and muscles, good wind and sound constitution unless he has some hereditary taint about him. There is scarcely any excuse in the majority of the districts in this country for not giving sufficient exercise to the youngster: although I must admit that in some it is almost out of the question, and in these districts horse breeding as well as cattle breeding is a waste of time, money and material. If it cannot be given in any other way, it is always possible to train the youngster to follow his dam about when she is ridden and hence all that is necessary is to take her out regularly and in this way give the foal exercise. In those portions of India, and fortunately there are still a few remaining, where the people are horsemen and ride their mares, this practice is carried out and the horses bred in these parts are vastly superior to those bred in others. No one attending a fair like Dera Ghazi Khan can fail to be struck by the clean shapely limbs of the young stock as compared with the ordinary run of stock generally seen. The best way to obviate the evils arising from want of exercise is to establish runs on to which the stock can be turned for a time each day, or on which they can be kept when the weather will allow of it. In the case of the poorer breeder of course this cannot be expected, but the latter can do much to avoid spoiling his stock by never tying them up or

keeping them confined to the stable during the daytime when it is possible for them to be outside running about loose and developing their limbs and muscles and thus increasing their value and general utility.

I am well aware of the difficulties which have to be contended against in highly cultivated tracts in doing even this much, but it is absolutely necessary to make every endeavour to allow as much freedom as possible, and to avoid tying up until the owner can find a suitable market for the youngster. I am of opinion that it is far better to sell off the stock as soon as possible in such districts than to keep it and ruin it before it has reached maturity. I have seen in many parts of the country, the mares and their foals of the village taken out to the village common and into the fields to graze with the cattle, the mare being loosely hobbled, and I think this is an excellent practice and worthy of every encouragement. In those parts of the country where the soil is not highly cultivated and waste land has a nominal value, it will well repay any man who has a few brood mares to enclose a portion of it as a run on to which his young stock and mares can be turned and take the exercise necessary for their development. For this purpose rich pasture is by no means essential as the stock will, of course, be sufficiently well fed in addition to the grazing. All that is necessary is dry friable soil and good natural drainage. If the ground be rocky there is no harm. Any kind of fence which will prevent the young stock from breaking out is sufficient, but the one recommended is a mud wall with a ditch sloping away from the paddock to the wall so that, should any of the stock fall or roll into it, they will do themselves no harm. It is a good plan to plant aloes on the top of the wall as this renders it more secure and at the same time protects it. Where good shady trees are not available and where the weather is at all inclement at any time of the year, and where the run does not communicate with the stables, a shelter-shed should be erected so that the stock can get shelter from the great heat of the sun or from rain and cold bleak winds. Stock put on to a run must not be neglected; it is necessary to provide them with food three times a day, unless they are brought up at night and fed in the stables, in which case it will only be necessary to feed them once on the run.

A plentiful supply of good pure water must be available for the horses at all times, so that they may keep in con-

dition. The best source of supply is either a perennial stream, or, failing that, a well with a trough attached, which is to be kept filled with water. Good water is as essential to the well-being of the horse as is good food, and care must be taken to see that the source from which the water is obtained is not contaminated by any injurious matters. On the whole the water from wells is, as a rule, to be preferred to that from streams, excepting perhaps that from hill streams, as the land bordering on the banks of streams must be of necessity low lying, and in such positions animal parasites and injurious infusoria are apt to find a suitable habitat. It is best therefore in selecting a run to avoid such situations as dangerous, as such diseases as surra are frequently met with there. If the water be drawn from wells into troughs, some little care should be given to the trough in the way of an occasional cleaning out, and a handful of lime thrown into it occasionally will be attended with benefit to the stock.

CASTRATION.

When it is noticed that the colts are beginning to get troublesome they should be castrated at once if they are well developed. It is the custom in this country to tie them up when they become troublesome, and this practice is the cause of nearly all colts being misshapen and unsound. In those places where they are castrated the stock shows up well, as it has been allowed to have some freedom: Dera Ghazi Khan Show will indicate the effect of castration on the stock. The time when it becomes necessary to castrate colts varies, but probably 18 months is near the mark. Any youngster not intended to become a stallion should be castrated about this time as he will become quieter, keep condition more easily, and, owing to the fact that he may be let loose amongst mares, he will get sufficient exercise to develop his frame and limbs.

There are certain points to be borne in mind in regard to the castration of young stock. In the first place the season of the year at which a colt is castrated has some influence on the coat; it has been noticed that colts which have been castrated when they have their rough coats on never carry a good coat at any future time, so this should be guarded against if the colt is a good one. The time of year which it is necessary to select is one when it is neither too hot nor too cold and when flies are least troublesome. Colts should not be castrated when they are suffering from any

disease whatever, nor when any epidemic disease is prevalent in the neighbourhood. They should be brought into fairly good condition before the operation is carried out and should not be too fat. A certain amount of knowledge is necessary in order that the colt may be castrated at the proper time as the operation modifies his conformation very considerably. It should be borne in mind that when a colt is castrated those parts of the frame which are most developed in the mare become more developed in him, and consequently, when the animal is castrated very early it more resembles a mare than a horse and, therefore, the operation will depend on the general conformation of the animal; a foal possessing a good forehead, and comparatively poor hind quarters, may be castrated early: if, on the other hand, there is ample development of the hind quarters and the forehead is comparatively badly developed, castration must be postponed.

I am strongly in favor of all colts being castrated unless they are intended for stallions: any animal of great promise may be kept on entire until it is decided whether or no he is suitable for the purpose. In these parts of India where the District Boards and Municipalities have recognised the importance of maintaining stallions for the purpose of covering the smaller mares, the necessity for the great number of horses of inferior quality does not exist, and these should be got rid of by castration. In this way the breed of horses in the district will gradually improve.

CARE OF THE FEET OF YOUNG STOCK.

Another very important point which is very frequently neglected is the proper care of and attention to the feet of young stock in order to maintain them in proper order. I may say that so far as the limbs, ligaments and tendons are concerned it is of the utmost importance to see that the feet are properly trimmed and levelled so that the limb during its growth may be always kept in a proper position. Nothing is more fatal to the soundness of the limbs of young stock, and their capabilities of performing hard work when grown up, than the proper maintenance of the foot during the early years of the animal's life. If a little consideration be given to this point, it will be obvious that many of the malformations of the limbs of horses may be referred to the fact that their feet have been neglected, and that owing to the unequal growth of the horn from some cause or another, the

parts have been subjected to undue strain and have adapted themselves to the position into which they have been forced.

The legs of young horses have been very aptly compared to willow twigs, which you may bend to any form you please. If a portion of the hoof be chipped off at an early age the other side of the foot grows on and the weight of the body is therefore borne on an unequal foot surface, strain being thrown on to one part of the leg more than another so that the tendons and ligaments are kept on the stretch and, being in a growing state, they adapt themselves to the altered position with the result that the animal grows up with crooked and misshapen limbs as the inevitable consequence. What can be more conducive to sloping pasterns and weakness of the suspensory ligaments and fetlocks than feet which have been habitually allowed to grow to an abnormal length at the toe where the foot naturally increases most rapidly in horn; the foot is as it were thrown back and the weight of the body is consequently borne almost entirely on the heels, the ligaments being in a state of continued tension. In the same way when a portion of the hoof is chipped off, the horn increasing on the opposite side of the hoof, the limb is again thrown into an unnatural position, and if the foot is higher on the outside than the inside there is a tendency for the internal ligaments of the fetlock to become stretched and the animal's toe is as a result turned out, a tendency to brushing being induced.

This tendency to the modification of the position of certain parts of the limbs by inequality in the level of the hoof may be turned to account in modifying the defects which may exist in those parts; thus, if the feet of the young animal be gradually manipulated, undue obliquity of the pasterns may be much benefitted by lowering the toes and throwing more weight on to them.

But in addition to the benefits which may be derived in the conformation of the limbs, the effect of proper attention to the foot itself cannot be too highly estimated. The old adage "no foot no horse" must be kept in mind and by proper attention we must keep the foot in as healthy a condition as possible; it must be kept rounded at the edges so as to prevent its becoming chipped away and split, a sharp look-out should be kept to detect any signs of thrush and other disease which, if detected, must be treated; undue brittleness of the horn must also be guarded against. It is evident therefore that it is very advisable to utilise the ser-

vices of the nalband every month or so, if we desire to rear stock with good, straight and sound legs. I feel that it is not possible to lay too great stress on this point, as I have seen so many otherwise valuable stock rendered almost valueless owing to their feet having been neglected and their limbs in consequence being misshapen.

EDUCATION OF THE FOAL.

The foal which is brought up in constant association with man generally grows into the most tractable, intelligent and fearless horse. This is earnestly to be desired, for, as far as my own experience goes, the so-called vice in horses is often nothing more or less than fear. Endeavours cannot too early be made to inspire the young animal with confidence and to make him fearless of man; to make him indeed regard man rather as a friend than an enemy. The education cannot be commenced too early; even when the foal is a few days old he should be petted and rubbed quietly about the body and legs so as to accustom him to being handled; as soon as possible he should be accustomed to having his feet lifted and an early opportunity should be taken to tap the sole. The utmost care and patience is required for these simple early lessons and a good deal of coaxing is often necessary to carry them out. The voice must never be raised of the young animal as the treatment it receives at this period of its existence makes a lasting impression on its mind and any harshness will probably be remembered.

At the age of about four months a small leather head stall may be put on to the foal; it should be provided with a strap about a foot and a half long so that he may be caught by it and be accustomed to being held and led about a little from time to time in the stall. About a month before weaning the foal is to be accustomed to being led about by a rein. The first time this is attempted and the foal experiences restraint it will attempt to escape; this must be gently but firmly resisted and when the animal understands what is wanted there is no difficulty. All his lessons should be taught with gentleness, and the obedience rewarded with something he likes to eat. If the young animal be turned out on to a run he must be accustomed to being caught and tied up at feeding time and may then be handled a little. I think that a plan we always adopted in Yorkshire of making the animals young-stock turned out to pasture of making the animals pass over certain obstacles to get to water or feed is a very

good one, especially with horses destined to become romounts as they are taught to jump naturally and, as a rule, prove apt pupils when they are schooled later on. The obstacles were usually poles which were at first placed very near the ground so that the horse could step over them; they were gradually raised as the horse became accustomed to them and the animal had to jump them to get to stable for feed or water. Little more than this handling need be done until the animal is to be broken to saddle—a subject which we need not here deal with as it does not come under breeding proper.

There is one thing against which I would earnestly warn the breeder in this country and that is to avoid working the horse too young and ruining his legs, and also to refrain from the use of the spiked bit which absolutely ruins the horse's mouth for life.

DISEASES OF STOCK.

DIARRHŒA.

The peculiar form of diarrhœa which attacks young animals whilst they are suckling has for a long time attracted considerable attention, because of its almost incurable character and the great mortality which attends it. It is the malady which causes the greatest mortality amongst the foals in all breeding establishments, and to my own knowledge it is a most serious disease amongst the young thoroughbred stock in England.

Symptoms.—The disease appears most frequently during the first eight days after birth. It generally appears suddenly in a young animal although there has apparently been no change in the general treatment of the stock or in their food supply. The fœces are very fluid and contain a quantity of mucus, they have a sour or foetid odour, and become light colored or greyish green, but generally whitish in color. The first intimation of the diarrhœa is generally the soiled condition of the tail, and the foal ceasing to suck. The creature seems suddenly to lose its strength, remains nearly always lying down, and when it gets up staggers about and is indifferent to surrounding objects; the eyes sink deeply into their orbits; saliva flows from the mouth, no attempt being made to swallow it. The foal very rapidly loses condition and the coat becomes dry and erect. Towards the end the foal remains immovable, as if paralysed, and dies without a struggle.

Causes.—The most ordinary cause seems to be some change in the milk of the dam, possibly when the food she receives is of too rich a nature, or, on the other hand, when the food is of poor quality and especially when it is in bad condition. The malady appears to be worst when the animals are kept in permanent stabling and seems to disappear when they are driven out to graze.

Treatment.—The most important thing to do is to attend to the cleanliness and the general health of the foal and the dam. As the disease seems to be in some measure contagious it is advisable not to put mares in the stable where a case has occurred when they are about to foal. The stable in which a case has occurred should be well disinfected and cleaned out. The disease should be checked as soon as possible after its appearance; if the motion is yellowish white the diarrhoea is dependent on simple weakness of digestion and white of egg and a little chalk is often of benefit; the whites of two eggs and about a drachm of chalk will be useful and may with benefit be followed by some astringent infusion.

The usual and perhaps one of the best modes of treatment is to give a dose of castor oil, 3 ounces at the commencement, in a little milk or gruel, and afterwards small doses of alkaline medicine, such as bicarbonate or biborate of soda, with a few drops of tincture of iron, and if there is straining and evidence of pain, a similar quantity of laudanum. Boiled rice or gruel may be used to give these medicines in and may also be given in small quantities at frequent intervals. The diet of the mare should be entirely changed and tonics and alkalies may be given to her with benefit. It is a very good plan to give some lime water occasionally: this may be conveniently done by putting 1 drachm of lime in a bucketful of water.

CONSTIPATION.

Perhaps the foal is more subject to constipation than is the young of any other animal. It usually occurs in foals whose dams have been fed for a long time on dry food and the result is more likely to follow if the dams have been worked until near their foaling time. Their milk is then deficient in those purgative properties which are so necessary for the young animal to get rid of the waste products (meconium) which have been accumulating during the time the foal was in the womb.

Symptoms.—A day or two after birth the foal appears to be uneasy, refuses to suck and strains to pass dung, has some pain in the belly, rolls on the ground and often lookt round to the sides; the back is arched and the foal grinds its teeth. If the condition is not remedied the foal is attacked with enteritis and dies amidst convulsions.

Treatment.—The preventive treatment consists in not withholding the first milk of the mare from the foal, as is customary in many parts of this country, and in attending to the food and condition of the pregnant animal for some time before foaling. The foal should get the first milk its dam gives. The treatment consists in removing the waste matters from the intestines. This may be effected by giving a soap or an oil enema, and previously removing as much as can be reached by a well-oiled finger. If these measures are not successful a dose of castor oil, 4 ozs., aided by enema, may be tried. Ghi about 4 ounces to 6 ounces melted and given milkwarm, is recommended.

WORMS.

These internal parasites are very troublesome to stock of all ages, but they are never more dangerous than during youth, when the animal needs all the nutrition possible to build up his system and can ill-afford to part with any to these pests. Unfortunately they are very common in foals and yearlings and their presence causes much mischief.

Symptoms.—When parasites exist in the digestive tract in any numbers, they cause considerable disturbance to health, giving rise to unthriftiness and debility. The foal which has commenced to graze, probably at the age of about four months, has increased appetite but ceases to develop, begins to look unhealthy, loses the brightness of its coat which looks rough, staring, harsh, and which grows longer than usual, especially about the flanks. The foal gradually gets thinner and the belly becomes large and pendulous. The action of the bowels is irregular the animal is sometimes constipated and at others attacked with severe diarrhoea. A dry, husky cough is very frequently present. In foals which are weaned, the most constant symptoms are perversion of the appetite, which causes them to eat all kinds of unnatural food; bad general condition despite a good appetite. In some cases the worms cause obstruction of the small gut and give rise to colic. The most important symptom of

all is, of course, the detection of the worms in the dung. There is generally a whitish powdery substance around the anus in horses suffering from worms.

Treatment.—As a preventive it is a good plan to give salt to all young animals, and to allow them access to a lump of rock salt which they can lick whenever they feel disposed to do so. It is generally difficult to give medicines to young foals and the best thing to do is to use those which are tasteless and will be readily taken in the food. For the treatment of worms in the foal the best thing to do is to give calomel in ten to fifteen grain doses in milk or a bran mash, the dose to be repeated after a day's interval, and four to six ounces of linseed oil to be given after the last dose. In yearlings and older animals half drachm doses of Fowler's solution given twice a day in the food has been found useful. Sulphate of iron and tartar emetic in equal quantities of twenty grain doses given twice a day for a couple of days and followed by a laxative of half a drachm of aloes and ginger has been of use. Before giving any of these medicines for worms, the horse should be kept without food for six or seven hours. Carrots are very useful as diet as they have some effect on certain forms of worms.

Some worms take up their residence in the rectum and are not easily acted on by drugs given by the mouth. The best way to get rid of these is to give an enema of warm salt water.

COLIC.

Colic, by which is meant pain in the belly, is the most common disease to which the horse is subject, and amongst entire animals it will be seen from the statistics which are from time to time published that it is the most frequent cause to which death is attributed. Quite 40% of the internal diseases of the horse are attributed to colic, and deaths are about 15%. It is, therefore, manifestly advisable for us to consider the chief causes of the disorder so that we may, as far as possible, avoid them.

Causes.—The disease may be caused by exposure to cold and more especially to rain and cold combined, when the animal is not accustomed to exposure, and especially if he be exposed to them when he is in a heated condition. It may be also caused by giving the horse very cold water to drink more particularly when he is hot.

Food of bad quality, such as is the grass sometimes brought in by the grass-cutters in the rains, when they can easily collect a lot of quickly grown and innutritious grass which is watery, contains very little nutriment, and which very rapidly ferments; coarse indigestible grass, especially the hard roots of dub; also grass which has been wetted by the grass-cutters to clean it and make it heavier, and which in this condition readily undergoes fermentation; all these are common causes of the disease. Gram which has been soaked and kept for a little time before being given, as it readily undergoes fermentation, is a cause.

Dirty grain, and grass which is very dirty, also induce the malady.

Inattention to the state of the bowels by which they are allowed to become constipated, which arises when horses are highly fed on more or less heating diet, large quantities of gram and barley for instance, and do not get sufficient exercise, or when measures are not taken to regulate them is a most frequent cause of the disease. These are some of the causes of colic which it is possible for us to avoid, and which are, therefore, of the most importance to us. Another very common cause which it is advisable for us not to lose sight of is watering the horse soon after feeding, without allowing a sufficient time to elapse for digestion to be completed. This has been previously briefly mentioned in the manual and need not be again dealt with. It will, therefore, be seen that it is advisable to take certain precautions to avoid the occurrence of this disease. We should be careful on all occasions to regulate the state of the bowels by judicious feeding: we should be careful that the food is of good quality and easy of digestion: we should avoid giving food which we know is apt to cause the disease, such as coarse dirty grass, or grain which has undergone fermentation, etc.: care should be taken to water the horse according to the generally accepted system, and when we have done all this we may rest easy in our minds that we have done nearly all in our power to avoid the disease.

Symptoms.—If, despite all our efforts, the horse becomes attacked by the disease the following symptoms or signs will be seen. The animal is suddenly attacked with pain without any previous warning being given. The horse paws with the fore feet, looks round at the flank, and strikes at the belly with the hind feet. He turns about in the box and makes attempts to lie down, flexing his limbs as though he

were going to do so, evidently being uneasy, and finally going down and, after rolling about a little, rising again. This performance is again gone through, the horse often groaning and continually looking round at the flank. These pains are not continuous, the animal being at times free and occasionally even beginning to eat a few mouthfuls: but they soon come on again and down the horse goes for another roll. The ears will be found to be cold and there may be some sweating at the base or root of them as well as on the sides of the neck, but, unless the case is due to the accumulation of gas, it is not common for the sweating to be general. The animal makes frequent attempts to pass urine, frequently stretching himself into the position for doing so, frequently passing the penis a little way out of the sheath, but failing to pass more than a few drops if any. This sign has been taken by the ignorant to show that the kidneys are affected, but this is by no means the case: it simply means that the bladder is influenced by the spasm.

When the attack is severe the signs are very often strange. He may flex the fore legs and kneel down on them, the hind quarters being elevated: he may also lie down like a dog does with the fore legs extended in front of him. He may be in such violent pain that he throws himself down violently, is quite unmanageable, and it is dangerous to approach him.

General treatment of colic.—We usually divide this disease into two forms, *viz.*:—*Spasmodic*; or that in which the cause is one simply acting on the gut and giving rise to spasm of it: and *flatulent* when the cause in addition to being sufficient to induce cramp or spasm gives rise to the formation of gas in the bowel and consequently distends it. The first form is not so serious as the second. When colic is due to exposure to cold and wet, the horse generally purges, and the treatment in such cases is more or less simple: the body and extremities should be hand-rubbed, clothing put on, and some stimulant later on given. We may, in the ab-mixture recommended for a bottle of beer if procurable, in sence of anything else, give a spirit and a couple of drams of ordinary ginger have been mixed. If we be in the jungle, and nothing else is obtainable, we may generally get assafœtida (ging), of which a dram or two may be mixed with the ordinary country spirit and a dram of ginger, the whole being mixed with a pint of water. It is advisable to

give a pint and a-half of sweet oil as a laxative in all cases of colic as this, when the spasm is reduced, causes the passage of the irritating matter from the bowel.

When the disease is caused by any irritating food whether it be due to spasm or to the accumulation of gas, much benefit is derived from hand-rubbing the belly. Great relief is also obtained from exercise at the walk in ordinary cases of moderate severity, and this should be given in addition to the draught. Care must however be taken not to adopt the custom prevailing in many places of trotting or galloping the animal, which will do great harm.

When there is formation of gas in the bowel the symptoms are generally slower in showing themselves, they come on more gradually, but are more continuous and dangerous. In this form, in addition to overcoming the spasm, we have, so far as possible, to stop the fermentation of the food in the gut which is causing the formation of the gas. For this purpose we cannot use anything better or more easily obtained than oil of turpentine, which drug is indeed most useful in all cases of colic, and which is recommended for general use.

The draught recommended is as follows :—

Oil of Turpentine	.	.	.	2 ounces.
Opium	.	.	.	1 drachm.
Linseed Oil	.	.	.	1½ pints.

These drugs are readily obtained in all bazars.

Much benefit follows the use of clysters, or enemas, and when there is anyone at hand who is capable of giving them they may be used. The most common enema in general use is warm water in which a little soap has been rubbed down. The water should be only milkwarm and the quantity to be injected is four or five quarts. Enemas may be repeated every half hour if necessary, but I do not think it advisable to give more than three. Before giving an enema the dung should be removed from the rectum. Great care should be taken not to injure the gut either in removing the faeces or giving the injection.

When the horse cannot be kept on his legs the best thing to do is to put him into a large loose box well bedded down with short straw or bhoosa, the angles to the walls being protected by bundles of straw which will prevent the animal injuring himself against them when rolling about. If such a box be not available it is better to make a bed for the animal in the open.

Briefly then the treatment of colic may be summarized as follows:—

In cases of moderate intensity:—
 Give the drench, hand-rub the belly for ten minutes, give an enema and walk the animal about. If not relieved in half an hour repeat the enema and continue the walking. If not relieved in an hour rub in a little mustard over the belly and give a drachm of opium, 1 dram of assafœtida in half a pint of water. In cases where the animal is in too great pain to be walked about, a good bed to be provided, a drench given, the belly hand-rubbed if possible and an enema given. Everything possible to be done to prevent the horse injuring himself. If no relief in an hour give opium 1 drachm and assafœtida 2 drachms in half a pint of water, and apply mustard to the belly.
 Care should be taken to avoid giving such drugs as tobacco, red pepper and the like as they are injurious. A pint and a half of oil should always be given early so as to effect the removal of the irritating food by causing slight purgation. Opium should not be given more than twice. Fomentations to the belly are useful and should be employed when there is any one who understands how to apply them; if they are not properly managed they are apt to do more harm than good.

STRANGLES.

This is a contagious disease of young horses which, if not properly treated, leads to much loss, and this is my reason for mentioning it here. It is a very common disease amongst young horses in the breeding districts, and in those which are damp and hot more especially. It only attacks the horse, and is most commonly seen between the ages of one and five years, although it may attack those of any age.

According as the disease is severe and complicated or mild, we speak of it as malignant and benign; when it runs its course regularly and is mild, the abscess forming naturally, with little disturbance to health, we call it "benign"; on the other hand, when the disease is made worse by the presence of lung disease and other complications, we say it is "malignant."

The commencement of an attack of strangles is announced by general symptoms which vary in intensity with

the severity of the attack. The preliminary symptoms may be so little marked as to pass unnoticed, but in most cases there is some fever. The animal is changed in appearance, and looks unhealthy and dull: the coat has an unhealthy rough appearance: there is no appetite and the animal seems to have lost his spirits. Symptoms of cold appear and a swelling under the jaw: the throat becomes sore and there is some difficulty in swallowing. There may or may not be a discharge from the nose but there generally is one; the swelling of the throat continues and an abscess forms on the seat of it, and as this increases in size it causes some difficulty in breathing and swallowing by pressing on the throat. By degrees the abscess forms and breaks, discharging its pus, and the horse recovers and is protected from a second attack of the disease. This is the ordinary form of strangles, and is the one of most importance to us here, as, if it be treated properly, there is every chance of the horse recovering; whilst if it be improperly treated there is every chance of complications arising and a fatal termination.

Treatment.—Our great aim in the treatment of this disease is to assist nature to get rid of the bad matters which are in the system and which she is trying to eliminate in the form of an abscess. In order then to assist nature we must do all we can to hasten the formation of the abscess and the discharge of the pus which it contains. The end we have in view then is to hasten the formation of the abscess and keep up the strength of the animal. The chief treatment consists in good nursing, but this is what is generally neglected. The horse must be put into a healthy, clean stable and kept out of draughts, should be given soft food to eat, such as bran mashes and linseed gruel with boiled barley; a few carrots sliced are often appreciated and nice young lucerne and young green rice will be eaten when nothing else will be taken. The food attended to, the next thing which is most important is to foment the part well for some hours during the day with hot water, and to be very careful that when the fomentation is stopped the part is well dried and rubbed with a little camphor oil or other stimulant to prevent it becoming chilled. If the cold symptoms are severe, much relief will be afforded to the animal by steaming the head with steam from very hot water sprinkled over hay in a nose-bag and put loosely on to the horse's head in the ordinary way. With regard to medicine, the

less the better; a little nitre in the drinking water is, as a rule, all that is required, more reliance must be placed in the feeding on soft, easily digested food and fomentation. When the abscess is nearly bursting, it is advisable to just make an opening into it at its lowest part where it is softest. It should be well washed out, if this can be done, and dressed with some simple antiseptic: the hole in the skin must not be allowed to close up, but must be kept open by placing some tow or a piece of cloth rolled into a cylinder into it, the wound being allowed to heal and fill up from the inside.
